

aomenc - Command Line Parameters

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Document Status

This document is an early first draft and should not be used as the definitive source of information for the libaom or aomenc code.

Introduction

This document describes each of the command-line parameters of **aomenc**, the AV1 reference software encoder provided as part of the AV1 Codec Library, **libaom** [1]. It is based on *commit-id 3.1.2-889-gdf61427b1* from the 'master' branch.

Definitions

Keyframe (KF)

Golden frame (GF)

Alternative Reference Frame (ARF)

Forward Key Frame (FKF)

Group of Pictures (GOP)

SubGOP

Usage

`./aomenc <options> -o dst_file src_file`

- `src_file` - input file that contains the source clip
- `dst_file` - output file to hold the coded AV1 bitstream

Options

Help

--help

Show usage options and exit.

Source Video Properties

--width=<arg>, **-w <arg>**

Frame width, in pixels.

--height=<arg>, **-h <arg>**

Frame height, in pixels.

--input-bit-depth=<arg>

Bit depth of each pixel in the source:

- 8 : 8-bits per color component
- 10 : 10-bits per color component
- 12 : 12-bits per color component

--input-chroma-subsampling-x=<arg>

Indicates whether the source video chroma planes are at full-resolution or half-resolution horizontally:

- 0 : chroma planes are at full resolution horizontally (**Default**)
- 1 : chroma planes are sub-sampled horizontally

For example, 4:4:4 format input requires `--input-chroma-subsampling-x=0`, but 4:2:2 and 4:2:0 format input requires `--input-chroma-subsampling-x=1`.

--input-chroma-subsampling-y=<arg>

Indicates whether the source video chroma planes are at full-resolution or half-resolution vertically:

- 0 : chroma planes are at full resolution vertically (**Default**)
- 1 : chroma planes are sub-sampled vertically

For example, 4:4:4 and 4:2:2 format input requires *--input-chroma-subsampling-y=0*, but 4:2:0 format input requires *--input-chroma-subsampling-y=1*.

--chroma-sample-position=<arg>

The chroma sample position when the chroma plane is sub-sampled, i.e. for non-4:4:4 format source video:

- unknown (**Default**)
- vertical
- colocated

--skip=<arg>

Skip, and do not encode, the first <arg> input frames from the source video. <arg> is 0 by default, and no frames are skipped.

--limit=<arg>

Encode <arg> input frames from the source video, starting from the frame specified by the skip parameter. By default all non-skipped input frames are encoded.

--fps=<arg>

Source video frame rate expressed as a ratio “rate / scale”, e.g. 60/1 indicates 60 fps, and 30/1001 represents 29.97 fps.

--timebase=<arg>

Output timestamp precision, in units of fractional seconds.

--yv12

Source format is YV12.

--i420 (Default)

Source format is 4:2:0.

--i422

Source format is 4:2:2.

--i444

Source format is 4:4:4.

--monochrome

Specifies that the source video is monochrome, i.e. each input frame only has a luma plane, and no chroma planes.

Output File

-o <arg>, **--output=**<arg>

<arg> specifies the name of the output encoded bitstream file.

--webm (Default)

Output in the WebM file format [TODO - Add Ref].

--ivf

Output in the IVF file format [TODO - Add Ref].

--obu

Output in the OBU file format, as defined in Section 5 [1].

--annexb=<arg>

Output in the length delimited bitstream format, defined in Annex B of [1].

--full-still-picture-hdr

Output a full frame header for a still picture:

- 0 : Full frame header (**Default**).
- 1 : Reduced still picture header

If the source is an image rather than video, this option allows a more compact header to be written, excluding the syntax elements that are specific to video content. See the definition of *reduced_still_picture_header* - Section 5.5.1 [1].

--forced_max_frame_width=<arg>

<arg> is the maximum frame width to be written in the sequence header, as defined by *max_frame_width_minus_1* - Section 5.5.1 [1].

--forced_max_frame_height=<arg>

<arg> is the maximum frame height to be written in the sequence header, as defined by *max_frame_height_minus_1* - Section 5.5.1 [1].

Encoder Configuration

-c <arg>, **--cfg=**<arg>

Configuration file to use. The format of this file is described in Appendix A.

--codec=<arg>

<arg> specifies the codec to use. Only “av1” is supported by the libaom/aomenc implementation.

--use-16bit-internal

Force use of an internal 16-bit processing pipeline.

-b <arg>, --bit-depth=<arg>

Bit depth of each sample in a reference frame buffer:

- 8 : 8-bits per color component
- 10 : 10-bits per color component
- 12 : 12-bits per color component

-u <arg>, --usage=<arg>

Usage profile number to use:

- 0 : Good
- 1 : Real-time
- 2 : All-intra

--profile=<arg>

Bitstream profile to use, as defined by *seq_profile* in Annex A.2 [1]:

- 0 : Main
- 1 : High
- 2 : Professional

--set-tier-mask=<arg>

Set bit mask to specify which tier each of the 32 possible operating points conforms to. The n^{th} bit in the mask indicates the tier for the n^{th} operating point (*seq_tier[n]* in [1]):

- 0 : Main Tier (**Default**)
- 1 : High Tier

--cpu-used=<arg>

Specifies the speed preset:

- 0..6 : in good mode (*--usage=good*)
- 6..9 : in realtime mode (*--usage=realtime*)

The higher the preset, the faster the encode, but quality may be sacrificed to achieve that speed-up.

--allintra

Use all intra mode.

--sb-size=<arg>

Superblock size to use:

- 64
- 128
- dynamic - determined by the encoder

--max-reference-frames=<arg>

Maximum number of reference frames allowed per frame:

- 3..6
- 7 (**Default**)

--reduced-reference-set=<arg>

Use reduced set of single and compound references:

- 0 : off (**Default**)
- 1 : on

--enable-ref-frame-mvs=<arg>

Enable temporal mv prediction:

- 0 : disabled
- 1 : enabled (**Default**)

--target-seq-level-idx=<arg>

Target sequence level index. Possible values are in the form of "ABxy" (pad leading zeros if less than 4 digits):

- AB : operating point (0..31)
- xy : level (0..31) that operating point AB is conformant to (*seq_level_idx* in *Appendix A [1]*)

Examples:

- "0000" means that operating point 0 conforms to level 2.0 (*seq_level_idx=0*)
- "1021" means that operating point 10 conforms to level 7.1 (*seq_level_idx=21*)

--min-cr=<arg>

Set minimum compression ratio, as an integer value:

- 0 (**Default**)
- 1-99

If non-zero, the encoder will try to keep the compression ratio for each frame higher than the given value divided by 100, as a percentage. For example, a value of 80 representing 80%, indicates that the compressed frame should be no larger than 80% of the size of the uncompressed frame.

--vbr-corpus-complexity-lap=<arg>

Set average corpus complexity per mb for single pass VBR using lap.

- 0 (**Default**)
- 1..10,000

--stereo-mode=<arg>

Defines the channel layout of the two decoded frames for stereo 3D video source:

- mono
- left-right
- bottom-top
- top-bottom

- right-left

--mtu-size=<arg>

MTU size for a tile group:

- 0 : No MTU targeting (**Default**)
- [TODO - Add Max MTU size]

Overrides the maximum number of tile groups.

--static-thresh=<arg>

Motion detection threshold.

Output Features

-q, --quiet.

Suppresses output indicating how the encode is progressing.

-v, --verbose

Show encoder progress.

--psnr=<arg>

Show PSNR in the status line:

- 0 : Disable PSNR status line display
- 1 : PSNR calculated using input bit-depth (**Default**)
- 2 : PSNR calculated using stream bit-depth.

--q-hist=<arg>

Show quantizer histogram (<arg>-buckets).

--rate-hist=<arg>

Show rate histogram (<arg> specifies the number of histogram buckets).

--disable-warnings

Disable warnings about potentially incorrect encoder parameter settings.

-y, --disable-warning-prompt

Display warnings, but continue without prompting the user.

--force-video-mode=<arg>

Force video mode:

- 0 : false
- 1 : true (**Default**)

Debugging

-D, --debug

Debug mode. Makes output deterministic.

--test-decode=<arg>

Test encode/decode mismatch:

- off - do not check for mismatch
- fatal - quit on mismatch
- warn - warn on mismatch

Passes

-p <arg>, --passes=<arg>

Number of encoding passes:

- 1 : 1-Pass
- 2 : 2-Pass
- 3 : 3-Pass

Multi-pass encoding generates a file containing the statistical analysis data for each pass except the last. These files may be named using the *--fpf* and *--two-pass-output* command line arguments for the first and second passes, respectively. Output from the last pass is the encoded bitstream file.

--pass=<arg>

Encoding pass to execute:

- 1 : 1st Pass
- 2 : 2nd Pass
- 3 : 3rd-Pass

--fpf=<arg>

Name of the file generated by the first pass, containing summary statistics to be used during the second pass.

--two-pass-output=<arg>

Name of the file generated by the second pass, containing summary statistics to be used during the third pass, when *--passes=3*.

Encoding Quality

--good

Use the “Good” quality deadline.

--rt

Use the “Realtime” quality deadline.

Encoding Mode

--end-usage=<arg>

Rate control mode:

- vbr : Variable bitrate
- cbr : Constant bitrate
- cq : Constrained QP
- q : constant quality

--lossless=<arg>

Lossless mode:

- 0 : false (**Default**)
- 1 : true.

Error Resilience

--global-error-resilient=<arg>

Enable global error resiliency features.

--error-resilient=<arg>

Enable error resilient features:

- 0 : false (**Default**)
- 1 : true

GOP Structure

--auto-alt-ref=<arg>

Enable the automatic placement of alternative reference frames.

--enable-order-hint=<arg>

Enable order hint:

- 0 : false
- 1 : true (**Default**)

--enable-overlay=<arg>

Enable the coding of overlay frames:

- 0 : false
- 1 : true (**Default**)

--min-gf-interval=<arg>

Specifies the minimum distance between golden frames (that defines the sub-GOP size):

- 0 : determined by logic within the code (**Default**)
- [TODO - Add range]

--max-gf-interval=<arg>

Specifies the maximum distance between golden frames (that defines the sub-GOP size):

- 0 : determined by logic within the code (**Default**)
- [TODO - Add range]

--gf-min-pyr-height=<arg>

Specifies the minimum number of hierarchical layers to be used within a GOP:

- 0 (**Default**)
- 1-5

--gf-max-pyr-height=<arg>

Specifies the maximum number of hierarchical layers to be used within a GOP:

- 0-4
- 5 (**Default**)

Optimization Metric

--tune=<arg>

Distortion metric to tune the encode to maximize:

- psnr
- ssim
- vmaf
- vmaf_with_preprocessing
- vmaf_without_preprocessing
- vmaf_neg
- butteraugli

--tune-content=<arg>

Characterizes the source material to tune the encoding process for:

- default - the encoder should determine characteristics of the source material (**Default**)
- screen - material is screen content, enable screen content coding tools
- film - material is film material [TODO - Add definition]

All AV1 profiles include the screen content coding tools, but by default aomenc will only consider using these tools if it determines that the source material is screen content, using a built-in detector. By setting *--tune-content=screen* the built-in detector is bypassed, the encoder assumes that the source is screen content and enables use of the screen coding tools.

Fixed-QP Settings

--cq-level=<arg>

Constant / constrained quality level:

- 0..63 : quantization level

--enable-chroma-deltaq=<arg>

Enable calculation of a delta quantizer value, which is added to *cq-level*, to produce the quantizer parameter for the chroma planes:

- 0 : false (**Default**)
- 1 : true

Rate Control Options

--target-bitrate=<arg>

Bitrate, in kilobits per second, kbps.

--undershoot-pct=<arg>

Minimum undershoot in data rate, specified as a percentage of *target-bitrate*. For example, *<arg>=20* suggests that the output data rate should not go below 80% of the *target-bitrate*.

--overshoot-pct=<arg>

Maximum overshoot in data rate, specified as a percentage of *target-bitrate*. For example, *<arg>=20* suggests that the output data rate should not go above 120% of the *target-bitrate*.

--bias-pct=<arg>

Bias toward achieving CBR and VBR objectives:

- 0 : fully CBR
- 100 : fully VBR

--min-q=<arg>

Minimum allowed quantizer parameter; specifies the best quality that can be achieved.

--max-q=<arg>

Maximum allowed quantizer parameter; specifies the worst quality that can be achieved.

--max-intra-rate=<arg>

Maximum proportion of bits that should be used to coding I-frames, specified as a percentage of *target-bitrate*.

--max-inter-rate=<arg>

Maximum proportion of bits that should be used to coding P-frames, specified as a percentage of *target-bitrate*.

--minsection-pct=<arg>

Minimum bitrate for encoding a GOP, specified as a percentage of *target-bitrate*.

--maxsection-pct=<arg>

Maximum bitrate for encoding a GOP, specified as a percentage of *target-bitrate*.

--frame-boost=<arg>

Enable the periodic increase in bits allocated to certain frames:

- 0 : off (**Default**)
- 1 : on

--gf-cbr-boost=<arg>

Amount by which to increase the allocation of bits to golden frames in CBR mode, as a percentage of the number of bits allocated to regular inter-frames.

--drop-frame=<arg>

Threshold, as a percentage of *target-bitrate*, beyond which source frames will be skipped to reduce the data rate by temporal resampling.

Entropy Coding

--cdf-update-mode=<arg>

Mode for updating cumulative distribution functions (CDFs) that are used for entropy coding:

- 0 : no CDF update
- 1 : update CDF on every frame (**Default**)
- 2 : selectively update CDF on some frames

--coeff-cost-upd-freq=<arg>

Frequency that the coefficient cost statistics should be updated:

- 0 : every superblock
- 1 : every superblock row, per tile
- 2 : every tile
- 3 : off - no update

--mode-cost-upd-freq=<arg>

Frequency that the mode cost statistics should be updated:

- 0 : every superblock
- 1 : every superblock row, per tile
- 2 : every tile
- 3 : off - no update

--mv-cost-upd-freq=<arg>

Frequency that the motion vector statistics should be updated:

- 0 : every superblock
- 1 : every superblock row, per tile
- 2 : every tile
- 3 : off - no update

--dv-cost-upd-freq=<arg>

Frequency that the dv statistics should be updated:

- 0 : every superblock
- 1 : every superblock row, per tile
- 2 : every tile
- 3 : off - no update

Reference Frame Resizing

--resize-mode=<arg>

Frame resize mode.

--resize-denominator=<arg>

Frame resize factor denominator.

--resize-kf-denominator=<arg>

Frame resize factor denominator, for a keyframe.

Superresolution

--superres-mode=<arg>

Frame super-resolution mode.

--superres-denominator=<arg>

Frame super-resolution scaling factor denominator.

--superres-kf-denominator=<arg>

Frame super-resolution factor denominator, for a keyframe.

--superres-qthresh=<arg>

Frame super-resolution qindex threshold.

--superres-kf-qthresh=<arg>

Frame super-resolution keyframe qindex threshold.

Client Buffer

--buf-sz=<arg>

Client buffer size, in milliseconds (ms).

--buf-initial-sz=<arg>

Client initial buffer size, in milliseconds (ms).

--buf-optimal-sz=<arg>

Client optimal buffer size, in milliseconds (ms).

Keyframe Placement Options

--disable-kf

Disable keyframe placement.

--kf-min-dist=<arg>

Minimum distance between successive keyframes.

--kf-max-dist=<arg>

Maximum distance between successive keyframes.

--enable-fwd-kf=<arg>

Enable forward reference keyframes:

- 0 : false (**Default**).
- 1 : true

--fwd-kf-dist=<arg>

Set the distance between successive forward keyframes:

- -1 : No repetitive forward keyframes (**Default**)
- N : Encode a forward keyframe every N-frames (N>1)

A forward keyframe is a keyframe encoded ahead of its natural order in the source. They can be used to facilitate open-GOP coding.

S-Frames

--sframe-mode=<arg>

S-Frame insertion mode:

- 1 : ????
- 2 : ????

--sframe-dist=<arg>

S-Frame interval, in frames.

Threading

--frame-parallel=<arg>

Enable frame parallel decodability features:

- 0 : false (**Default**)
- 1 : true

-t <arg>, --threads=<arg>

Maximum number of threads to use during encoding.

--row-mt=<arg>

Enable row based multi-threading:

- 0 : off
- 1 : on (**Default**).

Tiles

--num-tile-groups=<arg>

Maximum number of tile groups:

- 1 (**Default**)
- ????

--tile-columns=<arg>

Number of tile columns to use, log2:

- 0 : encode the frame as a single tile horizontally (**Default**)
- 1..6 : use $\text{pow}(2, \text{arg})$ tile columns.

--tile-rows=<arg>

Number of tile rows to use, log2:

- 0 : encode the frame as a single tile vertically (**Default**)
- 1..6 : use $\text{pow}(2, \text{arg})$ tile rows.

--enable-tpl-model=<arg>

Use a temporal layer model as the basis for rate distortion optimization (RDO):

- 0 : disable - use a flat model
- 1 : enable - use a fixed hierarchy (required if *deltaq-mode=1*).

The hierarchical model assigns frames to layers based on their temporal position in the GOP, and each layer has an associated quantization parameter.

Keyframe Filtering

--enable-keyframe-filtering=<arg>

Apply temporal filtering on key frames:

- 0 : no filter
- 1 : filter without overlay (**Default**)
- 2 : filter with overlay (Note: this is an experimental feature, it may break random access in players).

Temporal Filtering

--arnr-maxframes=<arg>

Maximum number of frames to filter to produce the filtered alternative reference frame:

- 0 : No temporal filtering.
- 1..15 : Use <arg> source frames centered on the frame being encoded

--arnr-strength=<arg>

Filter strength to use to produce the filtered alternative reference frame: (0..6).

--noise-sensitivity=<arg>

Noise sensitivity (frames to blur).

Look Ahead

--lag-in-frames=<arg>

Maximum number of input frames to buffer, or look ahead.

Loop Filters

--enable-cdef=<arg>

Enable the constrained directional enhancement filter:

- 0 : false
- 1 : true (**Default**).

--enable-restoration=<arg>

Enable the loop restoration filter:

- 0 : false (**Default** in Realtime mode)
- 1 : true (**Default** in Non-realtime mode).

--delta-lf-mode=<arg>

Enable delta-lf-mode:

- 0 : off (**Default**)
- 1 : on

Partitioning

--enable-rect-partitions=<arg>

Enable non-square partition types:

- 0 : false
- 1 : true (**Default**)

--enable-ab-partitions=<arg>

Enable A & B partition types (*PARTITION_HORZ_A*, *PARTITION_HORZ_B*, *PARTITION_VERT_A*, *PARTITION_VERT_B*; Section 6.10.4 [2]):

- 0 : false
- 1 : true (**Default**)

--enable-1to4-partitions=<arg>

Enable 1:4 and 4:1 aspect ratio partition types (*PARTITION_HORZ_4*, *PARTITION_VERT_4*; Section 6.10.4 [2]):

- 0 : false
- 1 : true (**Default**)

--min-partition-size=<arg>

Specify the minimum partition size:

- 4 : 4x4
- 8 : 8x8
- 16 : 16x16
- 32 : 32x32
- 64 : 64x64

- 128 : 128x128

For 4k or higher resolution frames, or for higher speed settings, the minimum partition size is 8x8.

--max-partition-size=<arg>

Specify the maximum partition size:

- 4 : 4x4
- 8 : 8x8
- 16 : 16x16
- 32 : 32x32
- 64 : 64x64
- 128 : 128x128

--partition-info-path=<arg>

Partition information read and write path.

Transform

--enable-dual-filter=<arg>

Enable the dual filter (Section 5.5.1 [2]), the independent selection of inter-prediction filter type in horizontal and vertical directions:

- 0 : false
- 1 : true (**Default**)

--enable-tx64=<arg>

Enable the use of the 64-point transform:

- 0 : false
- 1 : true (**Default**)

--enable-flip-idx=<arg>

Enable extended transform type:

- 0 : false
- 1 : true (**Default**)

Including:

- FLIPADST_DCT
- DCT_FLIPADST
- FLIPADST_FLIPADST
- ADST_FLIPADST
- FLIPADST_ADST
- IDTX
- V_DCT
- H_DCT
- V_ADST
- H_ADST
- V_FLIPADST

- H_FLIPADST

--enable-rect-tx=<arg>

Enable the non-square transform types :

- 0 : false
- 1 : true (**Default**)

--reduced-tx-type-set=<arg>

Use a reduced set of transform types (*reduced_tx_set*, Section 5.9.2 [2]).

--use-intra-dct-only=<arg>

Use DCT only for INTRA modes.

--use-inter-dct-only=<arg>

Use DCT only for INTER modes.

--use-intra-default-tx-only=<arg>

Use Default-transform only for INTRA modes.

--enable-tx-size-search=<arg>

Enable a search to find the best transform size to use for each block:

- 0 : false - transforms always have the largest possible size
- 1 : true (**Default**)

--sharpness=<arg>

Bias towards block sharpness in rate-distortion optimization of transform coefficients (0..7):

- 0 (**Default**)
- 1..7

Compound Prediction

--enable-dist-wtd-comp=<arg>

Enable distance-weighted compound prediction (Section 7.11.3.15 [2]):

- 0 : false
- 1 : true (**Default**)

--enable-masked-comp=<arg>

Enable masked (wedge/difference-weighted) compound prediction (*enable_masked_compound*, Section 6.4.1 [2]):

- 0 : false
- 1 : true (**Default**)

--enable-onesided-comp=<arg>

Enable one sided compound prediction:

- 0 : false

- 1 : true (**Default**)

--enable-interintra-comp=<arg>

Enable interintra compound prediction (*enable_interintra_compound*, Section [2]):

- 0 : false
- 1 : true (**Default**)

Specifies whether or not the mode info for inter-coded blocks may contain the syntax element *interintra* (Section 6.10.27 [2]).

--enable-diff-wtd-comp=<arg>

Enable difference-weighted compound prediction:

- 0 : false
- 1 : true (**Default**)

Combination Inter-Intra Modes

--enable-smooth-interintra=<arg>

Enable smooth interintra mode:

- 0 : false
- 1 : true (**Default**)

--enable-interintra-wedge=<arg>

Enable interintra wedge compound:

- 0 : false
- 1 : true (**Default**)

--enable-interinter-wedge=<arg>

Enable interinter wedge compound:

- 0 : false
- 1 : true (**Default**)

Motion Models

--enable-global-motion=<arg>

Enable global motion:

- 0 : false
- 1 : true (**Default**)

--enable-warped-motion=<arg>

Enable local warped motion:

- 0 : false
- 1 : true (**Default**)

--enable-obmc=<arg>

Enable OBMC:

- 0 : false
- 1 : true (**Default**)

Intra Modes

--enable-filter-intra=<arg>

Enable filter intra prediction mode:

- 0 : false
- 1 : true (**Default**)

--enable-smooth-intra=<arg>

Enable smooth intra prediction modes:

- 0 : false
- 1 : true (**Default**)

--enable-paeth-intra=<arg>

Enable Paeth intra prediction mode:

- 0 : false
- 1 : true (**Default**)

--enable-cfl-intra=<arg>

Enable chroma from luma intra prediction mode:

- 0 : false
- 1 : true (**Default**)

--enable-directional-intra=<arg>

Enable directional intra prediction modes:

- 0 : false
- 1 : true (**Default**)

--enable-diagonal-intra=<arg>

Enable diagonal (D45 to D203) intra prediction modes, which are a subset of the directional modes:

- 0 : false
- 1 : true (**Default**)

Has no effect if enable-directional-intra is 0.

--enable-intra-edge-filter=<arg>

Enable intra edge filtering:

- 0 : false
- 1 : true (**Default**)

--enable-angle-delta=<arg>

Enable intra angle delta:

- 0 : false

- 1 : true (**Default**)

Screen Content

--enable-palette=<arg>

Enable palette prediction mode:

- 0 : false
- 1 : true (**Default**)

--enable-intrabc=<arg>

Enable intra block copy prediction mode:

- 0 : false
- 1 : true (**Default**)

Quantization

--aq-mode=<arg>

Adaptive quantization mode:

- 0 : off (**Default**)
- 1 : variance
- 2 : complexity
- 3 : cyclic refresh

--deltaq-mode=<arg>

Selects the block-based adaptive quantization strategy to use, if any:

- 0 : off - all blocks in a frame use the same quantization parameter
- 1 : deltaq objective (**Default**)
- 2 : deltaq placeholder
- 3 : key frame visual quality
- 4 : user rating based visual quality optimization
- 5 : frame level chroma qp offset for HDR video

All values of <arg> except 0 currently require that *--enable-tpl-model=1*, as a prerequisite.

--quant-b-adapt=<arg>

Use adaptive quantize_b.

--disable-trellis-quant=<arg>

Disable trellis optimization of quantized coefficients:

- 0 : false
- 1 : true
- 2 : true for rd search
- 3 : true for estimate Y-RD search (**Default**)

--use-fixed-qp-offsets=<arg>

Calculate the quantization parameter for a frame based on its frame type and the temporal layer that it belongs to:

- 0 : false (**Default**)
- 1 : true

cq-level is only used for frames in the highest temporal layer, that is, non-reference frames. For frames in other layers *cq-level* is scaled by a fixed ratio that depends on both the layer and frame type (e.g. keyframe or interframe), to determine the quantization parameter.

Quantization Matrix

--enable-qm=<arg>

Enable quantisation matrices:

- 0 : false (**Default**)
- 1 : true

--qm-min=<arg>

Min quant matrix flatness (0..15), **Default** is 8

--qm-max=<arg>

Max quant matrix flatness (0..15), **Default** is 15

Color Space

--color-primaries=<arg>

Color primaries corresponding to the source samples (per CICP [3]):

- bt709
- unspecified
- bt601
- bt470m
- bt470bg
- smpte240
- film
- bt2020
- xyz
- smpte431
- smpte432
- ebu3213

--transfer-characteristics=<arg>

Transfer characteristics corresponding to the source samples (per CICP [3]):

- unspecified
- bt709
- bt470m
- bt470bg
- bt601

- smpte240
- lin
- log100
- log100sq10
- iec61966
- bt1361
- srgb
- bt2020-10bit
- bt2020-12bit
- smpte2084
- hlg
- smpte428

--matrix-coefficients=<arg>

Matrix coefficients (CICP) of input content:

- identity
- bt709
- unspecified
- fcc73
- bt470bg
- bt601
- smpte240
- ycgco
- bt2020ncl
- bt2020cl
- smpte2085
- chromncl
- chromcl
- ictcp

Decoder Model

--timing-info=<arg>

Signal timing info in the bitstream:

- unspecified
- constant
- model

Note: model only works for no hidden frames, no super-resolution yet.

Film Grain

--film-grain-test=<arg>

Film grain test vectors:

- 0 : none (**Default**)
- 1 : test-1

- 2 : test-2
- ...
- 16 : test-16

--film-grain-table=<arg>

Path to file containing film grain parameters.

Denoising

--denoise-noise-level=<arg>

Amount of noise:

- 0 : don't denoise
- 1..50 : noise level

--denoise-block-size=<arg>

Denoise block size:

- 32 (**Default**)

--enable-dnl-denoising=<arg>

Apply denoising to the frame being encoded when denoise-noise-level is enabled:

- 0 : false
- 1 : true (**Default**)

Stream timebase

--timebase:

The desired precision of timestamps in the output, expressed in fractional seconds:

- 1 / 1000 (**Default**)

Large Scale Tile

--large-scale-tile=<arg>

Large scale tile coding:

- 0 : off (**Default**)
- 1 : on (IVF output only)

See Appendix D in [2].

Appendix A - Configuration File Format

The configuration file is a text file where each line has the following format (all whitespace is ignored):

```
<param_name> = <param_value> # optional comment
```

Where <param_name> is the name of a configuration parameter and <param_value> is the value that should be assigned to it.

Configuration parameter names are those used in the reference code (fields in the data structure *cfg_options_t* in file *aom_encoder.h*), and only the following may be set through the configuration file:

- super_block_size
- max_partition_size
- min_partition_size
- disable_ab_partition_type
- disable_rect_partition_type
- disable_1to4_partition_type
- disable_flip_idtx
- disable_cdef
- disable_lr
- disable_obmc
- disable_warp_motion
- disable_global_motion
- disable_dist_wtd_comp
- disable_diff_wtd_comp
- disable_inter_intra_comp
- disable_masked_comp
- disable_one_sided_comp
- disable_palette
- disable_intrabc
- disable_cfl
- disable_smooth_intra
- disable_filter_intra
- disable_dual_filter
- disable_intra_angle_delta
- disable_intra_edge_filter
- disable_tx_64x64
- disable_smooth_inter_intra
- disable_inter_inter_wedge
- disable_inter_intra_wedge
- disable_paeth_intra
- disable_trellis_quant
- disable_ref_frame_mv
- reduced_reference_set
- reduced_tx_type_set

[TODO] If the same parameter is specified in the configuration file and on the command line, what value is used?

References

[1] Alliance for Open Media, AV1 Codec Library, <https://aomedia.googlesource.com/aom/> (Accessed 14th October 2021).

[2] Alliance for Open Media, *AV1 Bitstream & Decoding Process Specification*, <https://aomediacodec.github.io/av1-spec/av1-spec.pdf>, 8th January 2019. (Accessed 14th August 2021).

[3] CACP Specification. [TODO - Add reference]